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AUTHOR	Gehlbach, Hunter
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ABSTRACT

This study used M. Ford's (1992) conception of motivation to examine whether the factors that motivate students to achieve function differently for high, medium, and low ability learners in social studies classrooms. Participants were a diverse sample of 600 10th grade world history students. Data sources included student surveys, a multiple-choice content test, end of the year social studies grades, and test scores from school records. Regression equations examined how a fixed set of predictor variables related to: (1) students' posttest scores on the multiple choice test; (2) their final social studies grades; (3) their valuing of historical content; and (4) their satisfaction with the course. Results indicate that the high prior ability students' cognitive outcomes could be well predicted by their cognitive profiles at the beginning of the year. Medium prior ability students' cognitive outcomes were best predicted by a combination of their initial cognitive profiles and their mean levels of motivation during the year. Outcomes for low prior ability students were not well predicted by this set of predictor variables. Course satisfaction did not follow these trends. Future research directions are discussed. An appendix contains student survey items. (Contains 7 tables and 12 references.) (Author/SLD)

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Motivating Learners of Different Ability Levels

Hunter Gehlbach

Stanford University

Address
Hunter Gehlbach
PO Box 13618
Stanford, CA 94309

hgbach"at"stanford.edu

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Abstract

This study uses Ford's (1992) conception of motivation to examine whether the factors that motivate students to achieve function differently for high, medium, and low ability learners in social studies classrooms. Participants are a diverse sample of 10th grade world history students (N = 600). Data sources included student surveys, a multiple-choice content test, end of the year social studies grades, and test scores from school records. Regression equations examined how a fixed set of predictor variables related to (a) students' posttest scores on the multiple choice test, (b) their final social studies grades, (c) their valuing of historical context, and (d) their satisfaction with the course. Results indicated that the high prior ability students' cognitive outcomes could be well predicted by their cognitive profiles at the beginning of the year. Medium prior ability students' cognitive outcomes were best predicted by a combination of their initial cognitive profiles and their mean levels of motivation during the year. Outcomes for low prior ability students were not well predicted by this set of predictor variables. Course satisfaction did not follow these trends. Future research directions are discussed.

Motivating Learners of Different Ability Levels

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At some point in most educators' teaching careers they wonder why certain students in their classes achieve far below their ability while others excel. Many are particularly curious what factors are related to these differences in achievement for different students. The question of why particular groups of students achieve or fail to achieve is one that motivation researchers have only minimally addressed. Instead, they have predominantly studied practices and preconditions that tend to motivate all students. This research direction has provided teachers with a multitude of useful ideas. For example, offering students choice to bolster their feelings of self-determination and autonomy is likely to increase student motivation (Deci & Ryan, 1985). Teachers who foster an environment that encourages students to pursue mastery goals (i.e., goals to understand material and improve over time) are likely to increase the effort and time students expend on tasks (Ames, 1992). The research in this area is sufficiently comprehensive that this list of guiding practices could extend for pages.

However, these general guidelines do not address which facets of motivation are likely to matter most for certain subgroups of students. Though less developed, the subset of motivation literature focusing on how certain types of students are motivated to achieve has produced some valuable insights as to why many teachers may struggle to motivate all their students simultaneously. One such area that has been explored has focused on sex differences in motivation (Eccles, 1984). Using an expectancy-values framework, Eccles' showed that girls and boys had different expectations for success and differentially valued their mathematics classes. Other researchers have examined how students of different races may be differentially impacted by certain components of motivation. For example, Freeman, Gutman, and Midgley (2002) found that African-American and White students differed in their math grades and their self-efficacy in highly mastery oriented classrooms. As a final example, Meece and Holt (1993) used pattern analyses to examine how subgroups of students with certain goal configurations differed on achievement outcomes in science.

One subpopulation that has not been systematically examined in the motivation literature is groups of students who differ based on prior ability. Yet, it seems plausible that students with low prior ability may have had substantially different schooling histories than high prior ability students. These different histories may in turn impact the goals that they set for themselves upon entering a new class, their emotional investment in school, and the confidence that they bring to the classroom. Furthermore, low prior ability students may perceive the environment quite differently than their high prior ability counterparts. What one student may view as an opportunity, another may view as controlling.

Using Ford's (1992) theories of motivation and achievement as guides will help clarify how students from these different subgroups might vary in terms of which factors best predict their achievement. Ford (1992) argued that it is the combination of goals, emotions, and personal agency beliefs that produce motivation. Ford further states that motivation alone is insufficient for achievement. Motivation must be accompanied by skill, an adequate biological foundation, and a responsive environment. He represents these ideas with a formula as a heuristic:

$$\text{Achievement} = \frac{(\text{Motivation} \times \text{Skill})}{\text{Biology}} \times \text{Responsive Environment} \quad \text{(p. 248)}$$

Implicit in the representation of both motivation and achievement is the notion that if any component is absent, motivation and/or achievement will not occur. For example, if a student lacks emotion to energize her goal directed behavior, she will not be motivated to engage in the task at hand. Without this motivation, no matter what talents she was born with, how skillful she has become, and how encouraging the environment is, she will not approach the task and therefore will not achieve on the activity in question.

In addition to Ford's framework, one prior research finding is important to note. Which factors are important for achievement vary depending upon the specific achievement outcome (Gehlbach & Roeser, 2002, April). In other words, the factors that predict social studies content knowledge well will not necessarily predict course satisfaction. Though hardly an unintuitive finding, it is important to keep in mind given

the range of outcomes included in this study. Specifically, the following outcomes were examined: students' content knowledge of world history as assessed by a multiple choice test, their end of the year grade, their valuing of historical context, and their course satisfaction. Three of these outcomes relied heavily on students' cognitive capabilities. Multiple-choice tests are predominantly measures of content knowledge. Grades are a less clearly defined outcome; they are measures of content knowledge, the ability to apply knowledge, and often other factors such as effort and conscientiousness. Valuing of historical context assesses more of a cognitive disposition – the ability to think in a manner similar to a historian. Course satisfaction, on the other hand, is predominantly affective as opposed of cognitive. Thus, any patterns that emerge in examining these four outcomes may differ depending upon whether the outcome is predominantly cognitive, partially cognitive, or predominantly non-cognitive.

Although there is little prior research to guide specific predictions about the nature of achievement for subgroups of different prior abilities, Ford's conceptualization can guide some educated guesses as to how these groups of students may differ in the current study. Biological factors are not measured in this study because students in this sample are presumed to have adequate cognitive capabilities to allow for possible achievement in social studies. Instead, this study focuses on skills, motivation, and students' perceptions of the environment as predictors of the aforementioned outcomes.

It seems likely that achievement for students with high prior ability is likely to be most impacted by their skill or knowledge. They are the students who are most likely to apply themselves and make efforts to learn the material even when they are not interested in it. Especially for outcomes such as the multiple-choice test, these students are likely to engage in the task sufficiently that how well they do will be predominantly determined by their level of prior knowledge. On the other hand, for low prior ability students they might completely engage or disengage with a task such as a multiple-choice test based upon how motivated they were by the material and the course. Thus, their achievement may be determined more by their motivation than by their level of prior knowledge. For the other predominantly cognitive outcomes (grades and the valuing of historical context), the same pattern is likely to hold true. High prior ability students will likely perform similarly to the level of their prior ability. Low prior ability students will vary

more depending upon whether they actually engaged in the task or not. Medium prior ability students' achievement will most likely depend upon a combination of prior skill, motivation, and potentially their perceptions of the environment. For the outcome of course satisfaction, all students are likely to be equally impacted by how motivated they were and by how supportive they perceived the classroom climate to be. In sum, for predominantly cognitive achievement outcomes, the low prior ability students will vary mostly depending upon their levels of motivation and their perceptions of the classroom climate. For high prior ability students their achievement will depend mostly upon their prior skills and knowledge. The subgroup of medium prior ability students will vary based on both factors. For the more affective outcome of course satisfaction, no differences are expected between subgroups, but the perception of the classroom environment should play a larger role.

Method

Participants

This data set was collected as part of the California International Studies Project (CISP). This organization provides professional development to teachers of World History and International Studies. The professional development is comprised of a two-week summer institute with follow-up coaching sessions during the academic year. Participating teachers learn and agree to implement the cooperative groupwork techniques called Complex Instruction (Cohen & Lotan, 1997).

To evaluate the effectiveness of CISP multiple measures were collected from both teachers and students throughout the 2001-2002 school year. The evaluation used a quasi-experiment design matching participating CISP teachers with another world history teacher from the same school. Wherever possible, pre- and post-measures were collected. Pretesting and surveying of students occurred as early in the school year as could be arranged with teachers (usually between mid-September and early October); posttesting and post-surveys took place in late May or June just before students went on summer vacation.

This study used a subset of the full data set that includes all students for whom we were able to access their student records (specifically standardized test scores). This

subset included 600 students, from 36 classes, taught by 16 teachers in 7 schools. The gender balance was approximately even (53% female). The students were a racially diverse mix that is relatively common in California schools: 45% Hispanic, 31% White, and 20% Asian.

Measures

Although there are many different outcomes social studies teachers might hope for in their classrooms, we focused on four specific outcomes to cover a range of student results from increased content knowledge to improved affect towards social studies. The first outcome was a multiple-choice test that was designed by CISP to align with the state content standards for world history. The exact same test was administered at the beginning of the school year and again at the end. This allowed us to assess students' knowledge both at the beginning and end of a year of instruction from their teachers. Between having high face validity and correlating highly with the California STAR content standards test (pretest $r(525) = .742$, $p < .001$; posttest $r(508) = .785$, $p < .001$), our test was assumed to be a valid measure of world history content knowledge. The second outcome, students' end of the year social studies grade, was assumed to be a measure of content knowledge, ability to apply knowledge, and effort. Although students' grades as an outcome measure provide less insight into a clearly definable underlying construct, it seems fair to assume that they measure more than just content knowledge[1]. The third outcome was a survey scale[2] in which students reported how important they felt it was to place events in their proper historical context. In other words, the scale examined the extent to which students' self-reported that they held some of the cognitive habits or dispositions of historians. Like all the survey scales in this study students responded by circling an anchor point on a four-point scale from strongly disagree to strongly agree. This historical context scale (4 items; $\alpha = .74$ for pretest; $\alpha =$

[1] This is not to say that the multiple-choice test is measuring only content knowledge. Rather, the assumption here is that grades are more likely to reflect historical thinking skills, effort, applications of knowledge, etc. Thus, in comparison to the multiple-choice test outcome, grades are more of a multifaceted measure of a variety of cognitive skills and motivational dispositions.

[2] All survey scales were created using a principal components analysis (varimax rotation) on those items that were believed to be part of similar constructs (e.g., motivation). Items with factor loadings of less than .3 or loadings on more than one factor of greater than .4 were removed. A few additional items were removed during the reliability analysis to improve the internal consistency (as measured by Cronbach's alpha) or improve the face value of the scale.

.75 for posttest) included items such as "I need to know the history leading up to an event to truly understand it." Fourth, a course satisfaction scale (7 items; α= .90) was administered to assess students' affect towards the course. This measure was included because it may predict students' future enrollment in more history courses (Eccles, 1984). Unlike the historical context scale, these items were given only during the "post" administration. Students reported the extent to which they enjoyed the course and found it valuable. One item was, "I would recommend this course to a friend." Although these dependent variables cover a range of outcomes, most educators would agree that increases in all of them are desirable results of social studies instruction.

Before describing the predictor variables, it is vital to understand how the students were divided into high, medium, and low prior ability groups. Dividing the data set in this manner enabled us to look at subgroups of students who were likely to have had different schooling experiences. Because verbal ability (specifically vocabulary) tends to correlate highly with measures of general intelligence (Gustafsson & Undheim, 1996), we chose to use students' scores on their nationally normed SAT-9 reading tests as the variable for creating subgroups. Students who have low reading ability seemed likely to experience difficulty in most of their classes. Thus, we might hope that differences found between subgroups created with this variable would be more likely to generalize to other subject areas.

The predictor variables fell into three groups to roughly align with Ford's theory of achievement: assessments of their prior skill or knowledge, scales that measured students' motivation, and variables that measured their environment or their perceptions of their environment. Skill or cognition was assessed through the pretest measures of the multiple-choice test and the initial survey scale of historical context. Because the study only followed students over the course of the year prior year social studies grade and prior year satisfaction with social studies course were not available.

The student motivation scales consisted of mastery goal orientation, interest in world events, and self-efficacy in world history. These scales parallel Ford's notions of goals (setting goals to master material provides a direction for behavior), emotions (interest provides energy to act in pursuit of a goal), and personal agency beliefs (self-efficacy provides the confidence that the goal might be attainable and therefore worth

pursuing). The mastery goal orientation scale[3] was adapted from the Patterns of Adaptive Learning survey (PALS) that was created by Midgley et. al. (2000). Mastery goal orientation assessed whether students' goals were to learn and improve during the year. This scale (6 items; α = .84 for pretest; α = .84 for posttest) included items such as, "One of my goals is to master a lot of new skills in this class." Interest in world events (6 items; α = .75 for pretest; α = .82 for posttest) was measured by items such as "When I'm not in this class, I like thinking about world events." The self-efficacy scale (6 items; α = .85 for pretest; α = .86 for posttest) assessed the extent to which the students felt competent in doing the work that is assigned in the class. "I can do even the hardest work in this class if I try" is a typical item.

The classroom climate was assessed by two variables. First, a dichotomous variable indicated whether students were in the classroom of a CISP or comparison teacher. Second a survey scale assessed whether the affective climate of the classroom was supportive. This scale (4 items; α = .68 for pretest; α = .67 for posttest) asked about students' perceptions of the level of respect that existed in the classroom community. For example, "My classmates value my contributions in this class" was one item on this scale. The full scales for all of these measures are found in the Appendix.

A final note is that the skill/cognition variables of prior content knowledge and prior valuing of historical context were used as both pre- and post-measures. The scales assessing motivation and perceptions of the classroom climate, however, were averaged to form estimates of the mean levels of motivation and mean perceptions of the climate that students had over the course of the year.

Results

Before exploring how the fixed set of independent variables described in the methods section predicts the four outcomes, two assumptions need to be examined. First, there is an assumption that the dependent variables range from predominantly cognitive (multiple-choice test) to partially cognitive (social studies grades and historical context)

[3] Performance goal orientation was measured but not included in this study as it was not a good predictor of any of our four outcomes.

to a predominantly affective outcome (course satisfaction). If this is the case, then the variables on the extremes of this range should correlate more highly with those in the middle than with the variable at the opposite extreme. Table 1 show that this generally occurs. Specifically, students' multiple-choice posttest scores are unrelated to their satisfaction with the course. Students' multiple-choice test scores are closely related to their grades, r (522) = .61, $p < .01$, and moderately related to their self-reports of valuing the historical context, r (483) = .31, $p < .01$. Looking from the other end of the continuum, course satisfaction is most closely related to valuing the historical context, r (501) = .42, $p < .01$, and moderately related to grades, r (498) = .21, $p < .01$. The one small inconsistency is that historical context does not appear to be more closely related to grades, r (498) = .27, $p < .01$, than it is with multiple choice test.

Second, dividing the sample into thirds based on prior ability could restrict the range on certain outcomes (particularly in predicting posttest score since it is highly correlated with prior reading ability, r (525) = .71, $p < .01$). Thus, it makes sense to examine the means and particularly the standard deviations of the variables involved in the analyses. These results are shown in Table 2. While there are differences in the standard deviations for both the predictor and outcome variables, none seem so large as to generate concern that certain variables will necessarily behave differently for some subgroups but not for others.

In examining the first outcome, students' multiple-choice posttest scores (see Table 3), it is evident that in each equation, pretest score is the best predictor of posttest. However, between the different subgroups, there are several important differences. For the low prior ability students, being in a classroom they perceived to be supportive was negatively related to, and being in a project classroom was positively related to their posttest score. For medium prior ability students, pretest score was a much stronger predictor than other variables in the equation. However, two motivation variables, interest and self-efficacy, were also significantly related to this outcome. High ability students' pretest was very closely related to their posttest score. No other predictors were significant for these students. The predictors explained less than a quarter of the variance in posttest score for the low prior ability students while explaining almost half of the variance for high prior ability students.

Pretest scores were also strong predictors of students' year-end social studies grades (see Table 4). However, they were no longer as powerful relative to the other variables in the equation. For example, within the low and medium prior ability students, mastery goal orientation was also a strong predictor of final grades. Among high prior ability students, both cognitive predictors (pretest and prior valuing of historical context) were significant, as was supportive classroom climate. Across all subgroups, CISP students tended to receive higher grades than comparison students. Similar to the previous outcome, the predictors explained much more of the variance in social studies grade for the high prior ability students than for the low prior ability students.

Different predictors emerged as important in predicting students' year-end valuing of historical context (see Table 5). Self-efficacy emerged as the only significant predictor for the low prior ability students. For the medium prior ability subgroup, one cognitive variable (pretest) and two motivation variables (mastery goal orientation and self-efficacy) were significant predictors. High prior ability students' valuing of historical context was a much stronger predictor than any of the other predictor variables, although mastery goal orientation was also a positive predictor. None of the environmental predictors were significant. The same trend of the predictors explaining far less of the total variance in the outcome for low (versus high) prior ability students continued.

The results for predicting course satisfaction (see Table 6) differ from the results of the more cognitive outcomes. To begin with, whether one looks at the subgroups or the full regression equation, all the significant cognitive predictors are *negative* predictors. For low prior ability students, prior valuing of historical context is negatively related to course satisfaction. All three motivation variables, on the other hand, are significantly related to this outcome. Being in a project classroom is also associated with elevated course satisfaction for these students. For the medium prior ability students little valuing of historical context at the beginning of the year is also associated with high course satisfaction by the end of the year. However, by far the strongest predictor of course satisfaction for these students is mastery goal orientation. Interest was also a significant predictor. Mastery goal orientation was a strong positive predictor of course satisfaction for high prior ability students also. Their pretest scores were negatively

related to this outcome. Another major difference between this outcome variable and the previous three is that the adjusted-r^2 values were higher for the low (versus high) prior ability students this time.

The cognitive variables, in particular, seemed to vary widely for the three subgroups in terms of how well they predicted the outcomes. Thus, it seemed wise to run one more analysis to see if the pre-post measures (particularly for the two cognitive predictor variables) were more stable for the high than for the low prior ability students. These results are shown in Figure 1. As the figure shows, the correlations between pre- and post- measures are stronger for the high prior ability students than the low prior ability students on every variable used in the study that was measured at the beginning and end of the year. With minor exceptions, the medium group fell in between this range. Except for their perceptions of how supportive the classroom climate was, pre- and post- measures always correlated above $r = .50$ for the high prior ability students. For the low prior ability group, all pre-post correlations were below $r = .45$. Although there were substantial changes in the means from the multiple-choice pretest to the posttest, for all the survey scales the means stayed relatively the same – no mean differences were greater than .2 on the four point scales for any subgroup (see Table 2).

Discussion

The two assumptions examined at the outset of the results section will help guide the interpretation of the findings. The first notion was that the outcome variables range from the predominantly cognitive outcome of a multiple-choice test (specifically focusing on knowledge) to the partially cognitive outcomes of social studies grade and historical context to the predominantly non-cognitive (i.e., affective) outcome of course satisfaction. This seems like a valid assumption at face value, and it is comforting to see that the correlations support this assumption. Second, as Table 2 indicates, although the means of certain variables such as students' multiple-choice tests, their grades, and their self-efficacy differed substantially, the standard deviations for all the variables were roughly equivalent. This finding illustrates that differences between low, medium, and high prior ability students found in the outcomes of the regression equations are unlikely to be a function of the distribution of these variables.

Four hypotheses were explored through the regression equations presented in tables 3-6:

- For high prior ability students, achievement on the three cognitive outcomes will depend mostly upon their prior skills and knowledge.
- Medium prior ability students' achievement on cognitive outcomes will depend upon a combination of motivation, skill, and their perceptions of the environment.
- Low prior ability students' achievement on these outcomes will be best predicted by the motivational and environmental variables.
- For the predominantly non-cognitive outcome of course satisfaction, no differences will be found between subgroups.

The first hypothesis was supported. For each of the three cognitive outcomes the strongest predictors for the high prior ability students were their prior cognitive states. This pattern was quite prominent for predictions of content knowledge and valuing of historical context. Although grades were less strongly predicted, both prior cognitive factors were significantly related to this outcome. It is possible that if social studies grades from students' previous teachers could have been collected, that would have been a particularly strong predictor of students' final social studies grade. Only one motivational predictor was significant for these students and this only occurred in predicting students' year-end valuing of historical context.

Two reasons seem particularly viable as to why prior cognitive states (i.e., knowledge and previous disposition to value historical context) might have been much more important than their levels of motivation throughout the year in explaining these outcomes. As posited earlier, it may be that even if their motivation tends to be low, these students are still willing to engage in and apply themselves to tasks enough to achieve at a reasonable level. It is also plausible that the combination of goals, emotions, and personal agency beliefs that was measured in this study was not the type of motivation that relates to achievement for these students. Perhaps their capacity to strive for educational attainment (e.g., to get into a good college) is what truly drives these students and would explain substantial variance in their achievement.

The second hypothesis, that medium prior ability students would be best predicted by a combination of prior cognitive states and motivational factors, also received

substantial support. For each of the three cognitive outcomes, there were significant predictors in both the cognitive and motivational domain. This result distinguishes the medium prior ability students from both other subgroups on the multiple-choice test and distinguishes them from the high subgroup on social studies grade.

This results lends some support to Ford's (1992) notion of achievement. Although the environmental variables were not important in most cases, it may be that none of the classroom environments that the medium prior ability students were in were so unresponsive so as to inhibit achievement. Because the three outcomes in question are all cognitive to some degree, it is not surprising that the significant cognitive predictors are stronger than the significant motivational predictors in two out of the three outcomes.

The third hypothesis, that the achievement of low prior ability students would be related most closely to their levels of motivation, was not supported. However, there were two results pertaining to these students that warrant exploration. First, being in CISP classrooms seemed to benefit their content knowledge, their grades, and their satisfaction with the course. For other subgroups, being in CISP classrooms, only seemed to benefit their grades[4]. The CISP professional development workshops focus on Complex Instruction. This method of teaching is particularly geared towards creating more equity in heterogeneous classrooms. Thus, it is not surprising that this facet of the environment was disproportionately advantageous to these students.

The second finding regarding the low prior ability students was that this set of predictors explained much less of the variance in their achievement as compared to the achievement of the medium and high prior ability students. Perhaps Ford's (1992) conception of achievement is more applicable to the higher two subgroups of students than it is to the low prior ability students. Possibly another conception of achievement e.g., Snow's ideas (Stanford Aptitude Seminar, 2002) of performance and commitment pathways as the pivotal components of achievement, would have better explained these students. Perhaps Ford's theory does work equally for all students but the particular

[4] Because students in CISP classrooms got higher social studies grades across all subgroups of students, this particular result is difficult to interpret. Perhaps students worked harder in these classrooms and deservedly earned higher evaluations from their teachers. However, it is equally plausible that teachers' who have undergone the professional development training with CISP systematically assign higher grades than comparison teachers.

measures of skills, motivation, and responsive environments used here are not the ones that are important for the low subgroup of students. For example, perhaps the responsive environment that matters most for these students is actually their home environment. When their families foster a supportive home climate they may achieve highly, but when the home environment places other pressures on these students, their intellectual development may suffer.

The fourth hypothesis (like the third) received no real support. The notion behind this hypothesis was that because course satisfaction did not depend upon prior cognitive factors, students from all three subgroups would be equally likely to enjoy world history. This notion looked promising given that the means in Table 2 that showed no differences between the subgroups in their levels of satisfaction with the course. However, contrary to what was predicted, each subgroup varied greatly in which factors related to their enjoyment of the course. For the low prior ability students, all the motivation variables were positively related to the outcome. Although mastery goal orientation was closely related to course satisfaction for all subgroups, for the medium subgroup, it was overwhelmingly important. There were two significant predictors for the high group but no one variable or group of predictors that appeared critical.

One result that is confusing initially for this outcome is why the cognitive factors that were significant predictors of course satisfaction were negatively related to the outcome. By rerunning the same analysis and substituting gain scores (instead of prior scores) for the cognitive factors, the results remained similar with one exception. Gains on the cognitive factors were positively associated with course satisfaction. Because prior scores and gain scores are inversely related (if you start out with a low score, its easier to improve), it appears the negative relationship between prior cognitive states and course satisfaction masked the fact that students who improved over the course of the year were more satisfied with the course. In sum, while motivation and satisfaction were closely related for the low subgroup, setting goals to master and actually mastering new content knowledge appeared to be most important for the high subgroup. For the medium group, both cognitive and motivational factors were related to course satisfaction.

One final result helps explain some of these findings. High prior ability students were much more consistent over the course of the year. Within this subgroup, interested students tended to remain interested, students with low self-efficacy at the beginning of the year usually remained lacking in confidence, and so on. For the low prior ability students, there was more variability from the beginning of the year to the end. Thus, as compared to students from the high subgroup, low prior ability students who began the year uninterested in world history were more likely to become interested over the course of the year (and vice-versa). This phenomenon of greater consistency within the high subgroup helps explain why prior content knowledge and prior valuing of historical context were such strong predictors of those same constructs at the end of the year. Similarly this phenomenon partially explains why the prediction equations for the low subgroup explained much less variance than the other two subgroups.

Although this issue of consistency begins to explain some of the findings, there is still much left for future research to investigate. The five main findings from this study may be helpful in guiding future work on students with different prior ability levels. First, high prior ability students' achievement of cognitive outcomes appears to be closely linked to their previous cognitive capacities. Second, medium prior ability students' achievement on cognitive outcomes appears to be linked to both cognitive and motivational factors. Third, low prior ability students' achievement on these outcomes was not well understood – the fixed set of predictors explained much less of the variance in each cognitive outcome for this group of students. Fourth, these first three findings may or may not hold true for non-cognitive variables – course satisfaction appeared to produce different patterns. Finally, students in the high prior subgroup appear to be more consistent over the course of the school year than the students in the low subgroup.

Conclusions

It would be premature to draw conclusions about whether low prior ability students are less consistent or predictable than high prior ability students. Similarly, it is too early to conclude that high prior ability students' achievement is predominantly dependent upon their prior achievement and that their motivation is less important for them. These findings could vary substantially depending upon whose conception of

achievement is being used and which specific measures are employed to operationalize that theory. Thus, it would be extremely premature to attempt to answer teachers' questions of what factors contribute to the variable achievement of different groups of students in their classes.

However, there is compelling evidence that this research direction warrants further exploration. Students with differing levels of prior ability appear to achieve in different ways. Learning more about how cognitive, motivational, and environmental factors relate to achievement differently for students of different prior ability levels, may help us tailor future instruction to all students. Professional development programs such as CISP would likely find this type of research invaluable.

Two directions for future research seem particularly appropriate. First, other outcomes and operationalizations of achievement should be explored. This study examined three types of cognitive outcomes and one affective outcome. If common measures of motivation such as effort or persistence were used as outcome variables, would the same patterns of results emerge? Would results look similar for other affective outcomes such as liking of history? Similarly, future research could explore whether different configurations of independent variables that are related to achievement would produce similar patterns of results.

A second direction worth pursuing is to see if these same patterns emerged in different subject areas. Perhaps because mathematics is frequently viewed as a domain in which students' ability is more fixed (Stodolsky, Salk, & Glaessner, 1991), prior cognitive states may be more important for all students not just those of high prior ability. Stodolsky et al's work also indicates that achievement outcomes in mathematics and social studies classrooms could differ because students have different perceptions of the import of the classes (fundamental vs. enrichment) and therefore might still persist in boring math classes (because they are required) though they would disengage in a comparably boring social studies class.

Although replication studies are needed before definitive conclusions can be reached about how students of differing prior abilities may achieve differently, this line of investigation may hold much promise for helping teachers motivate their students to achieve.

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Table 1

Correlations for outcome and predictor variables.

		1	2	3	4	5	6	7	8	9	10
Outcomes	1) Multiple Choice Posttest										
	2) Social Studies GPA	.61**									
	3) Historical Context (Post)	.31**	.27**								
	4) Course Satisfaction	.03	.21**	.42**							
Cognitive Predictors	5) Multiple Choice Pretest	.74**	.56**	.24**	-.06						
	6) Historical Context (Pre)	.23**	.24**	.46**	.10*	.26**					
Motivation Predictors	7) Mastery Goal Orientation	-.02	.12**	.45**	.55**	-.01	.38**				
	8) Interest in World Events	.26**	.20**	.41**	.45**	.21**	.44**	.50**			
	9) Self-Efficacy	.34**	.33**	.42**	.30**	.34**	.44**	.34**	.44**		
Classroom Climate Predictors	10) Supportive Classroom Climate	.05	.21**	.20**	.23**	.09*	.24**	.33**	.27**	.24**	
	11) Classroom type (0 = comparison, 1 = CISP)	.31**	.35**	.15**	.10*	.20**	.11*	.01	.12**	.09*	.24**

Correlations: The three motivation predictors and Supportive Classroom Climate are mean scores of students' pre- and post-survey responses.

** Correlation is significant at the 0.01 level.

* Correlation is significant at the 0.05 level.

Table 2

Means and standard deviations of outcome and predictor variables by prior ability.

		Low		Medium		High	
		Mean	SD	Mean	SD	Mean	SD
Outcomes	1) Multiple Choice Posttest	18.82	6.51	25.99	6.04	33.00	6.30
	2) Social Studies GPA	1.13	0.88	2.20	1.12	2.92	1.21
	3) Historical Context (Post)	3.02	0.46	3.15	0.51	3.22	0.49
	4) Course Satisfaction	2.70	0.62	2.74	0.69	2.69	0.68
Cognitive Predictors	5) Multiple Choice Pretest	14.87	4.41	19.06	4.88	25.39	6.83
	6) Historical Context (Pre)	3.01	0.45	3.09	0.52	3.22	0.51
Motivation Predictors	7) Mastery Goal Orientation	3.17	0.43	3.11	0.46	3.04	0.47
	8) Interest in World Events	2.40	0.47	2.40	0.49	2.62	0.51
	9) Self-Efficacy	2.86	0.42	3.00	0.47	3.26	0.46
Classroom Climate Predictors	10) Supportive Classroom Climate	2.75	0.52	2.72	0.50	2.78	0.45

Note: N ranged from 154 to 194.

Table 3

Predicting Valuing of Historical Context for High, Medium, Low Readers: Standardized regression coefficients, F-values, and adjusted r-squares.

Multiple Choice Posttest

Predictors	Prior reading ability			Full equation
	Low	Medium	High	
	β	β	β	β
I. Cognition				
Pretest	0.37**	0.53**	0.59**	.65**
Valuing hist. context (pre)	0.16	-0.16	0.11	.03
II. Motivation				
Mastery goal orientation	-0.05	-0.13	-0.02	-.09*
Interest in world events	0.03	0.18*	0.09	.09*
Efficacy	0.05	0.19*	0.01	.10*
III. Environmental				
Supportive classroom climate	-0.21*	-0.05	0.06	-.09**
Project (0/1)	0.20*	0.14	0.09	.14**
Total adjusted r-squared	.22	.34	.47	.77
F-value	6.46	10.50	19.93	87.97
N	136	132	148	418

β = standardized beta regression coefficient
*$p < .05$; **$p < .01$

Table 4

Predicting Social Studies Grades for High, Medium, Low Readers: Standardized regression coefficients, F-values, and adjusted r-squares.

	Final Social Studies Grade			
	Prior reading ability			Full equation
Predictors	Low	Medium	High	
	β	β	β	β
I. Cognition				
Pretest	0.20*	0.35**	0.33**	.51**
Valuing hist. context (pre)	0.06	-0.10	0.16*	.04
II. Motivation				
Mastery goal orientation	0.25**	0.26*	0.15	.12**
Interest in world events	-0.15	-0.04	-0.15	-.09
Efficacy	0.03	0.11	-0.06	.07
III. Environmental				
Supportive classroom climate	0.08	0.05	0.17*	.05
Project (0/1)	0.19*	0.24**	0.29**	.23**
Total adjusted r-squared	.15	.25	.34	.65
F-value	4.86	7.72	12.47	46.76
N	156	142	154	454

β = standardized beta regression coefficient
*$p < .05$; **$p < .01$

Table 5

Predicting Valuing of Historical Context for High, Medium, Low Readers: Standardized regression coefficients, F-values, and adjusted r-squares.

Valuing of Historical Context

Predictors	Prior reading ability			Full equation
	Low	Medium	High	
	β	β	β	β
I. Cognition				
Pretest	0.04	0.18*	0.06	.06
Valuing hist. context (pre)	0.11	0.12	0.48**	.25**
II. Motivation				
Mastery goal orientation	0.15	0.25*	0.26**	.24**
Interest in world events	-0.03	0.14	0.01	.05
Efficacy	0.22*	0.26**	0.12	.21**
III. Environmental				
Supportive classroom climate	0.08	0.00	-0.07	-.04
Project (0/1)	0.07	0.06	0.03	.06
Total adjusted r-squared	.14	.43	.44	.59
F-value	4.15	14.64	16.03	29.16
N	136	125	132	395

β = standardized beta regression coefficient
*$p < .05$; **$p < .01$

Table 6

Predicting Valuing of Historical Context for High, Medium, Low Readers: Standardized regression coefficients, F-values, and adjusted r-squares.

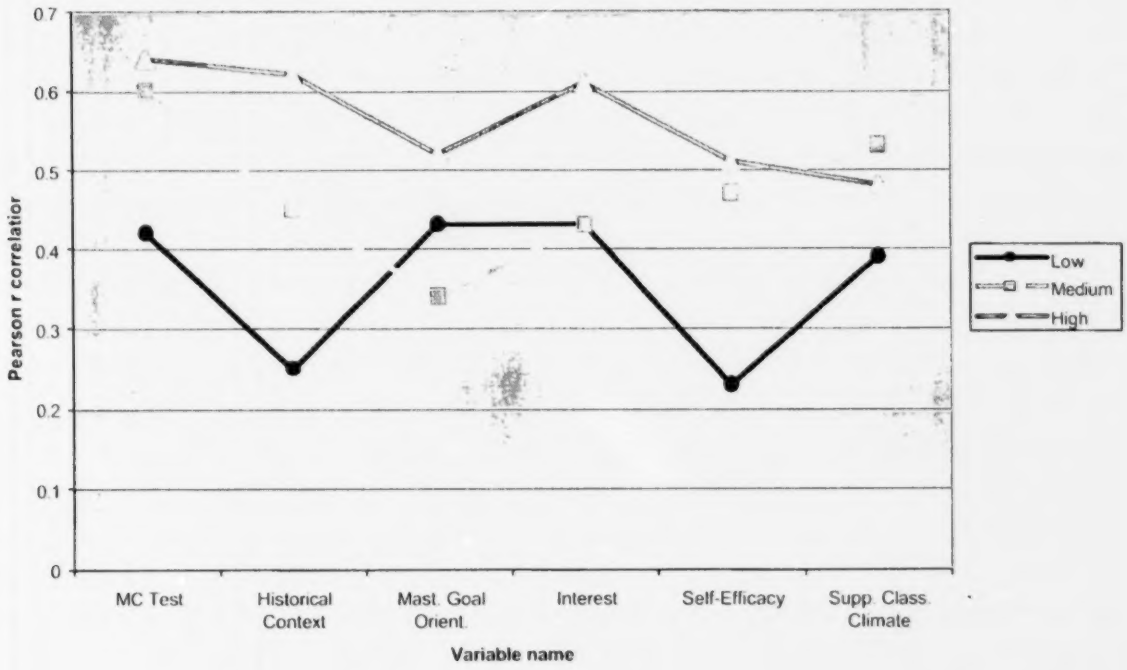
Course Satisfaction

Predictors	Prior reading ability			Full equation
	Low	Medium	High	
	β	β	β	β
I. Cognition				
Pretest	0.05	-0.01	-0.27**	-.16**
Valuing hist. context (pre)	-0.19*	-0.38**	0.03	-.19**
II. Motivation				
Mastery goal orientation	0.34**	0.65**	0.37**	.44**
Interest in world events	0.26**	0.17*	0.18	.21**
Efficacy	0.28**	0.05	0.02	.15**
III. Environmental				
Supportive classroom climate	-0.01	-0.01	0.12	.00
Project (0/1)	0.18*	0.05	-0.05	.08
Total adjusted r-squared	.46	.40	.26	.59
F-value	17.36	12.89	7.50	29.41
N	136	125	132	395

β = standardized beta regression coefficient
*$p < .05$; **$p < .01$

Figure 1

Correlations between pre- and post- measures for selected predictor and outcome variables



Appendix

Motivation

1. Mastery Goal Orientation (α = .84 pre & .84 post; 6 items)

One of my goals in class is to learn as much as I can.
It's important to me that I improve my skills in this class.
It's important to me that I learn a lot of new concepts in this class.
It is important to me that I thoroughly understand my class work.
One of my goals is to master a lot of new skills in this class.
I do my work in this class because I like to learn new things about the world.

2. Interest in World Events (α= .75 pre & .82 post; 6 items)

When I'm not in this class, I like thinking about world events.
I often connect what I am learning in class to events going on in the world today.
I am interested in international issues when I encounter them outside of this class.
Outside of this class, I like thinking about how to resolve world problems.
I read about world events in magazines or books in my free time.
I want to master challenging concepts about the world.

3. Self-Efficacy (α= .85 pre & 86 post; 6 items)

I'm certain I can read the material assigned in this class.
Even when writing assignments are hard in this class, I can still do them.
I'm certain I can understand even the most difficult readings that we are assigned for this class.
I can write well for even the most challenging assignments in this class if I try.
Even when reading assignments are hard in this class, I can still do them.
I can do even the hardest work in this class if I try.

Context

4. Supportive Classroom Climate (α= .68 pre & .67 post; 4 items)

My classmates value my contributions in this class.
We treat each other with respect in this class.
Students do not use "put downs" in this class.
My classmates respect me as a person.

Outcomes

5. Valuing Historical Context (α= .74 pre & .75 post; 4 items)

To understand a historical event, it is necessary to know the circumstances that existed before the event.
I need to know the history leading up to an event to truly understand it.
Knowing about the background of a time and place in history makes it more understandable to me.
I want to know what lies behind the story when I study a conflict in the world or another country.

6. Satisfaction with Course (α= .90 post only; 7 items)

I like the learning approach used in this class.
I have found it valuable to study history the way we have in this class.
I would recommend this course to a friend.
I enjoy this course.
I would like to take a course similar to this one in the future.
I like the approach to learning history that we have used in this course.
Knowing what I know now, I would still take this course if it were an elective.

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